

REMARKS

Reconsideration and allowance of the above-identified application is respectfully requested. Claims 1-21 remain pending.

The drawings have been objected to because the Office Action alleges that the teeth on the driving cam do not appear to extend in a radial direction as claimed, but in a longitudinal direction. As discussed in greater detail below, the Applicants believe the amendments made to the specification and claims obviates this objection.

Claims 1-9, 13-15 and 18 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. In particular, the Office Action alleges that there appears to be an inconsistency between what is disclosed in the Applicants' drawings and what is claimed, with respect to a 'plurality of radially extending teeth' on the driving cam. The Office Action states that "[t]he drawings appear to show these teeth as being 'positioned' radially along an engaging surface of the cam and extending longitudinally.' As discussed in greater detail below, the Applicants believe the amendments made to the specification and claims obviates this rejection.

Claims 10, 11, 17, 19 and 20 are rejected under 35 U.S.C. §102(b) as being anticipated by Korean Patent No. 2002-035553 (The '553 patent). Claims 1-9 and 12-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Korean Patent No. 2002-035553 in view of U.S. Patent No. 5,799,371 to Lin (The "Lin" patent). Further, claims 18 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Korean Patent No. 2002-035553 in view of the Lin patent. These rejections are respectfully traversed.

Specifically, the Applicants respectfully submit that the '553 and Lin patents, viewed individually or in combination, fail to teach or suggest the specific features of the

embodiments of the present invention for a one step automatic hinge device and information terminal as explicitly recited in independent claims 1, 10 and 17.

In particular, the Applicants submit that the '553 patent fails to teach or suggest all of the features recited in independent claims 10 and 17, including the feature of a clutch part for rotating the sub-body by the driving force of the driving part, whereby, when the sub-body rotates by external force, the clutch part preventing rotating force of the sub-body from being transmitted to the driving part. Rather, the '553 patent merely discloses a motor, clutching member and reduction gear train whose only apparent and stated purpose is to reduce the rotary power of the motor (10) and convert it into rotary power of larger torque. Further, the '553 patent fails to disclose or suggest features of certain dependent claims. For example, the '553 patent fails to teach or suggest that in a state in which the sub-body [of an information terminal having a main body and a sub-body coupled to a rear surface of the main body] is folded to come into close contact with the main body, the display device is partially exposed above one end of the sub body, as recited in claim 19. Furthermore, the '553 patent also fails to teach or suggest that the sub-body is installed with first and second keypads at both surfaces thereof, respectively, each keypad having a plurality of key buttons, as recited in dependent claim 20.

Furthermore, the Applicants submit that the '553 patent and the Lin patent, either alone or in combination, fail to teach or suggest the feature recited in claim 1 of a driven cam installed to receive an elastic force so as to tightly engage with the driving cam in a state in which it faces the driving cam, the driven cam being formed at one end thereof with a plurality of teeth spaced apart from each other at equal angles to be engaged with the teeth of the driving cam, thereby simultaneously rotating according to rotation of the driving cam, wherein, if the driven cam rotates by external force, the teeth of the driving cam are disengaged from the teeth of the driven cam, thereby preventing a driving force of the driven cam from being transmitted to the driving cam. Furthermore,

the Office Action fails to provide adequate motivation in combining the prior art references.

These rejections will now be discussed in more detail.

The present invention relates to an information terminal including cellular phones, PDAs, palm PCs and the like. More particularly, the present invention relates to a hinge device of an information terminal for rotatably coupling a main body and a sub-body of the terminal. The present invention provides a one step automatic hinge device and an information terminal therewith, which enables a sub-body of the terminal to be automatically opened away from, and closed to, a main body of the terminal. The one step automatic hinge device and information terminal therewith can freely adjust an opening angle of a sub-body provided in the terminal at the user's request. The hinge device of the present invention comprises a driving motor, and a reduction module for reducing the revolutions per minute (RPM) of the driving motor that comprises a driving shaft for receiving a rotating force of the driving motor transmitted through the reduction module, and a driving cam capable of linearly reciprocating on a part of the driving shaft in a longitudinal direction thereof while being coupled to the driving shaft to rotate according to rotation of the driving shaft. The driving cam of the present invention is formed at one end thereof with a plurality of longitudinally extending teeth spaced apart from each other at equal angles. The hinge device further comprises a driven cam installed to receive elastic force so as to tightly engage with the driving cam in a state in which it faces the driving cam, the driven cam being formed at one end thereof with a plurality of teeth spaced apart from each other at equal angles to be engaged with the teeth of the driving cam, thereby simultaneously rotating according to rotation of the driving cam. Hence, if the driven cam rotates by external force, the teeth of the driving cam are disengaged from the teeth of the driven cam, thereby preventing a driving force of the driven cam from being transmitted to the driving cam.

The present invention further comprises a hinge device of an information terminal comprising a main body, a sub-body to be opened away from or closed to the main body while rotating about a hinge axis extending in one direction of the main body, and the hinge device for rotatably coupling the main body to the sub body. The hinge device comprises a driving part generating a driving force for rotating the sub body, and a clutch part for rotating the sub-body by the driving force of the driving part. Hence, when the sub-body rotates by external force, the clutch part prevents a rotating force of the sub-body from being transmitted to the driving part.

Still further, the present invention also comprises an information terminal comprising a main body formed at a front surface thereof with a display device, a sub-body coupled to one side of the main body to rotate relative to the main body, thereby exposing and covering the display device, and a support rotatably coupled to a rear surface of the main body. The support operates to be spread by a certain angle for supporting the main body in a state in which the main body is inclined by a certain angle from a certain surface on which the terminal is disposed. The information terminal further comprises a one step hinge device having a driving part generating a driving force for rotating the sub-body and a clutch part for rotating the sub-body by the driving force of the driving part. Hence, when the sub-body rotates, the one step hinge device prevents rotating force of the sub-body from being transmitted to the driving part.

Concerning the 35 U.S.C. §112, second paragraph, rejection, the Applicants respectfully submit that claims 1, 13 and 18 are being amended to correspond with the drawings, as well as the description in the Detailed Description of the Preferred Embodiments portion of the Patent Application specification. Specifically, these claims are being amended to state that the plurality of teeth on the driving cam extend longitudinally as is clearly shown in the drawing figures (see especially Figs. 1 and 3).

Additionally, the specification has been amended in a similar manner to make clear that the plurality of teeth shown on the driving cam extend in a longitudinal manner.

In view of the above and the amendments to claims 1, 13 and 18, the Applicants respectfully request that the § 112, second paragraph rejection be withdrawn.

Turning now to the §102 rejection, the '553 patent discloses a hinge apparatus for manually and automatically opening and closing a folder. The '553 patent further discloses a foldable apparatus using the hinge apparatus to open and close a folder in a manual mode by a user's force and in an automatic mode by the driving of a motor. The hinge apparatus comprises a motor, reduction gear unit, a first and second cam, an elastic member and a clutching member. The motor generates clockwise or counter-clockwise rotary power. The reduction gear unit is comprised of a ring gear portion, a reduction gear train and an output shaft, and is used to convert the rotary power of the motor with an increase in torque. A pair of lands, formed in the first cam, engage with a pair of grooves formed in the second cam. The housing provides a cylindrical space in which the second cam, the first cam, the elastic member, the clutching member and a portion of the motor are installed. A coil spring is used as the elastic member. The coil spring is accepted in a space defined by the outer surface of a ring gear, the inner surface of the housing, a coupling part and the first cam. The clutching member comprises the second elastic member, a snap ring and a washer. The second elastic member is combined so as to enclose the output shaft and provides elastic force. The snap ring is supported by the elastic force of the second elastic member and is coupled with the second cam. The washer supports the bottom of the second elastic member.

The Office Action cites the '553 patent as providing all of the features of independent claim 10, including a clutch part for rotating the sub-body by the driving force of the driving part, whereby, when the sub-body rotates by external force, the clutch

part prevents the rotating force of the sub-body from being transmitted to the driving part. It is well known, however, that all of the claim features must be present in one prior art reference for a valid 35 U.S.C. §102(b) rejection. In this instance, it is respectfully submitted that the Office Action has not shown that all of the claim features of claim 10 are present in the '553 patent. Particularly, the Office Action alleges that the clutching member (130) provides the function of "rotating the sub-body by the driving force of the driving part, whereby, when the sub-body rotates by an external force, the clutch part preventing rotating force of the sub-body from being transmitted to the driving part." Respectfully, the Applicants submit that this language is not present in '553 patent, and nowhere is it taught or suggested that the function of the clutch part (130) is as the Office Action alleges. It is mere supposition on the part of the Office Action to allege that the function of the clutching member (130) of the '553 patent works in an identical manner as the clutch part of the Applicants' present invention. There simply is no evidence to support that assertion. Therefore, it is respectfully suggested that the rejection of claim 10 be withdrawn.

Regarding claim 11, the Applicants respectfully submit that since it has been shown that the '553 patent does not disclose or suggest all of the features of claim 10, and since claim 11 depends from claim 10, the rejection of claim 11 under 35 U.S.C. §102(b) should be withdrawn.

The Office Action cites the '553 patent as providing all of the features of claim 19, including the claim features of a support rotatably coupled to a rear surface of the main body, the support operating to be spread by a certain angle for supporting the main body in a state in which the main body is inclined by a certain angle from a certain surface on which the terminal is disposed, and a clutch part for rotating the sub-body by the driving force of the driving part, wherein, when the sub-body rotates, the one step hinge device prevents rotating force of the sub-body from being transmitted to the driving

part. As has already been discussed above, the '553 patent does not in any way teach or suggest a clutch part for rotating the sub-body by the driving force of the driving part, wherein, when the sub-body rotates, the one step hinge device prevents a rotating force of the sub-body from being transmitted to the driving part. Instead, as discussed above, the '553 patent lacks any description in regarding to the clutching member (130). Furthermore, it is respectfully submitted that the '553 patent does not teach or suggest the claim feature of a support rotatably coupled to a rear surface of the main body, the support operating to be spread by a certain angle for supporting the main body in a state in which the main body is inclined by a certain angle from a certain surface on which the terminal is disposed as is also found in independent claim 17. It is therefore respectfully submitted that the 35 U.S.C. §102(b) rejection of claims 10 and 7 be withdrawn.

Regarding claims 19 and 20, the Applicants respectfully submit that since it has been shown that the '553 patent does not disclose or suggest all of the features of claim 17, and since claims 19 and 20 depend from claim 17, the rejection of claims 19 and 20 under 35 U.S.C. §102(b) should also be withdrawn.

Turning now to the §103 rejection, the Office Action alleges that claims 1-9 and 12-16 are unpatentable under 35 U.S.C. §103(a) over the '553 patent in view of the Lin patent. This rejection is respectfully traversed.

The Lin patent discloses a pivoting joint connected between a first part and a second part of an instrument, permitting the first part to be turned relative to the second part and retained at one of a series of angular positions. The pivoting joint further includes a first coupling member with a ratchet fastened to the first part of the instrument and a shaft mounted in an axle hole in the second part of the instrument. The Lin patent further discloses a sleeve and a spring holder mounted around the shaft within the axle hole of the second part of the instrument and forced by spring means to hold down the

shaft, and a second coupling member fixedly mounted on the shaft and having a ratchet meshed with the ratchet of the first coupling member.

As set forth in M.P.E.P. § 2142, the legal requirements for establishing a prior art rejection under 35 U.S.C. §103(a) are as follows:

To establish a *prima facie* case of obviousness, three basic criteria must be met. *First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings.* Second, there must be a reasonable expectation of success. *Finally, the prior art references (or references when combined) must teach or suggest all the claim limitations.* The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ.2d 1438 (Fed. Cir. 1991). Emphasis added.

Respectfully, it is submitted that the prior art cited by the Examiner does not teach or suggest all of the claimed features, as required. Furthermore, it is also respectfully submitted that there is a lack of adequate motivation to combine the prior art references.

The Office Action states that the '553 patent discloses, among other claim features, the claim feature of a "longitudinally reciprocating driving cam 90 on a rotating shaft 56, a driven cam 100 installed to receive elastic force so a [sic] from a coil spring 132 so that the driven cam tightly engages with the driving cam, wherein, if the driven cam rotates by external force, the cams are disengaged, thereby preventing a driving force of the driven cam from being transmitted to the driving cam." See Office Action, June 17, 2004, page 5. As required under *In re Vaeck*, the prior art reference must disclose all of the claim features. It is respectfully submitted the '553 patent does not teach or suggest that the first and second cams 90, 100 operate to prevent a driving force of the driven cam from being transmitted to the driving cam. As discussed above, the '553

patent is silent with respect to the operation of the first and second cam 90, 100. For this reason alone, it is respectfully submitted that the rejection of claim 1 is in error and should be withdrawn.

Furthermore, as discussed above, to establish a *prima facie* case of obviousness, the Office Action must show that “some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead [an] individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). “The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). The showing must be “clear and particular, and it must be supported by actual evidence.” *Teleflex, Inc. v. Ficosa North American Corp.*, 299 F.3d 1313, 1334, 63 U.S.P.Q.2d 1374, 1387 (Fed. Cir. 2002) (quoting *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999)). It is not sufficient to rely on “common sense and common knowledge,” there must be specific evidence to support the motivation. *See In re Lee*, 277 F.3d. 1338, 1344-45, 61 U.S.P.Q.2d 1430, 1434-35 (Fed. Cir. 2002).

In this case, the Office Action has made no showing of a motivation to combine based on actual, specific, evidence. With respect to the combination of the ‘553 patent with the Lin patent, the Examiner asserts that it “would have been obvious at the time of the invention was made for one skilled in the art to have modified ‘553 in this way, as discloses [sic] in Lin, for the purpose of gaining the added benefit of manually retaining the hinge member in a series of angular positions, relative to the driving cam”. *See* Office Action, June 17, 2004, page 6. The Office Action cites no evidence in support of this purported motivation. None of the references relied upon by the Examiner suggest that the longitudinally extended teeth of the Lin patent can be used in the clutch part of

the '553 patent, for at least two reasons. First, the '553 patent, as has been discussed above, does not teach or suggest the use of its clutching member (130) for the function of preventing a driving force of the driven cam from being transmitted to the driven cam. Secondly, the ratchets 3, 30 of the Lin patent operate for the sole purpose of permitting of a first part to be turned relative to the second part and retained at one of a series of angular positions. Furthermore, the longitudinally extended teeth of the present invention operate in a manner that is not taught or suggested by either the '553 patent and the Lin patent. The Lin patent teaches that "less friction force exists between the ratchets 3, 30 (*because the teeth of each ratchet slope in one direction*) . . ." Column 3, lines 17-19, emphasis added. In the present invention, the teeth of the driving cam are disengaged from the teeth of the driven cam, thereby preventing a driving force of the driven cam from being transmitted to the driving cam. Therefore, it is respectfully submitted that the motivation provided by the Office action is in error, and for that additional reason the rejection of claim 1 should be withdrawn.

Regarding claims 2 through 9, the Applicants respectfully submit that since it has been shown that the combination of the '553 patent and the Lin patent do not disclose or suggest all of the features of claim 1, and that there no legally sufficient motivation provided to combine the two patents, and since claims 2 through 9 depend from claim 1, the rejection of claims 2 through 9 under 35 U.S.C. §103(a) should be withdrawn.

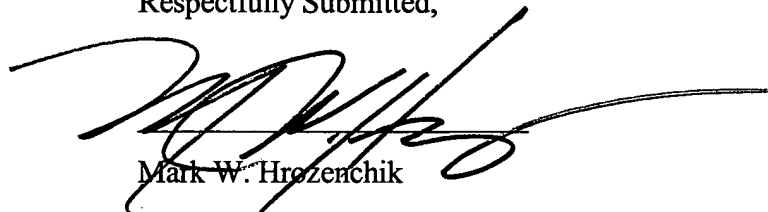
For similar reasons as discussed above in regard to claim 1, it is respectfully submitted that the rejection under 35 U.S.C. §103(a) of claims 12-16 should be withdrawn.

Accordingly, for all of these reasons, all claims should be found to be allowable over the combination of the '553 patent and the Lin patent.

For all of the reasons discussed above with respect to the '553 patent, the Applicants respectfully submit that the teachings of the '553 patent does not anticipate claims 10, 11, 17, 19 and 20. In addition, for all of the reasons discussed above with respect to the combined teachings of the '553 patent and the Lin patent, the Applicants respectfully submit that the teachings of the '553 patent and the Lin patent would not have rendered the invention as recited obvious to one skilled in the art. Accordingly, the Applicants respectfully request that the Examiner withdraw all of the rejections.

In view of the above, it is believed that the application is in condition for allowance and notice to this effect is respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully Submitted,



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